



Impacts of

AB 1857 (Garcia, 2022) and SB 54 (Allen, 2022) on Conversion Technologies



LOS ANGELES COUNTY
SOLID WASTE MANAGEMENT COMMITTEE/
INTEGRATED WASTE MANAGEMENT TASK FORCE



Now, I will provide a brief presentation on two new enacted State laws, Senate Bill 54 and Assembly Bill 1857. Hopefully, this presentation will lead to discussion on their impacts on the development of conversion technology facilities, CTs, in California.

Overview

- Summary of solid waste processing technologies
- CT Developments in the US and California
- Misconceptions of CTs
- Senate Bill (SB) 54 and Assembly Bill (AB) 1857
- What do we want and don't want from CTs?
- Discussion



Here is an overview of my presentation.

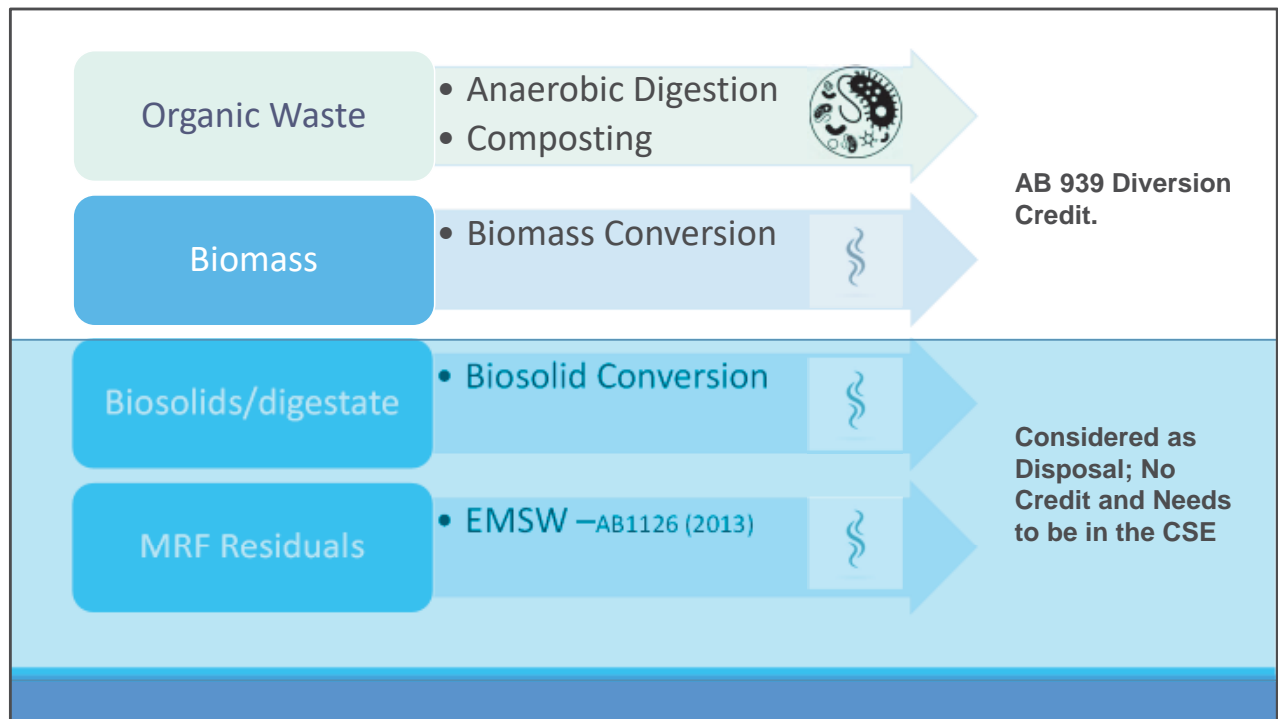
I will begin by providing an overview of various solid waste processing technologies.

I summarize CT facilities being developed in the United States.

I will cover some of the misconceptions about CTs and address these misconceptions by describing the benefits of CTs.

I will briefly describe the provisions of SB 54 and AB 1857 and how they are not only a result of misconceptions about the technology but also a misconception about our waste stream.

I will discuss the impacts that these laws will have, as well as recommendations on how to address these impacts.



This slide shows an overview of various pathways to process solid waste using CT.

Thermal processes represented by wavy lines and biological represented by the microbiology organisms.

We have AD which is a biological process.

Conversion thermal technologies, such as gasification and pyrolysis, do not have oxygen present and do not burn the waste. Instead, they use high heat and pressure to convert the waste into syngas.

As we all know, local jurisdictions must comply with AB 939 and divert at least 50 percent of their solid waste from disposal.

The only thermal process that is not considered disposal and receives diversion credit is called biomass conversion (California Public Resources Code 40106.) It includes both combustion technologies (which burn the waste) as well as non-combustion thermal conversion technologies (such as gasification and pyrolysis). The process of biomass conversion is defined by its feedstocks, which are limited to separated green waste, wood waste, and nonrecyclable paper.

The thermal conversion of biosolids or engineered municipal solid waste other than biomass would be considered disposal and would not receive diversion credit.

As you can see, pathways that receive diversion credit do not have to be identified in the siting element since they are not considered disposal.

CT Facilities in California



Phoenix Energy



Red Rock Biofuels



Sierra Energy



Kore

A few projects have been developed in the United States.

Phoenix Energy's biomass gasifier in Merced, California is the first biomass gasifier to meet strict California air-quality standards.

The plant produces about a ton of biochar per day and sales of biochar are incorporated into its business model.

Red Rock Biofuels has started construction on a gasification facility in Lakeview, Oregon.

The facility will convert waste woody biomass into renewable jet, diesel and gasoline blendstock fuels.

The construction process will take approximately two years.

In addition, there are demonstration projects are also being developed in California.

Because they process small amounts of waste, usually less than 50 tons per day, they do not have to go through the full permitting process.

Sierra Energy and Kore have demonstration-scale structures that can test various feedstocks and generate operational data and produce renewables such as natural gas, hydrogen, and biochar.

They are looking for sites in LA County to develop a commercial-scale facility.

Other companies have tried to develop CT facilities in California but did not undertake the project.

For example, Ottawa-based Plasco Energy Group had plans to develop a gasification facility in Monterey County.

In 2010, CalRecycle delivered a legal opinion on gasification, which helped Plasco earn pre-certification from the California Energy Commission as a renewable energy source. That would've allowed Plasco to sell power for a premium, which the company needed to make the plant cost-effective.

Unfortunately, this decision was reversed and the facility was not able to keep its renewable energy certification. Without the certification Plasco was unable to develop the facility.

This incident, along with the lack of AB 939 diversion credit for CTs, is likely a significant factor in discouraging other companies from making an effort to develop CT facilities in California.

Misconceptions



CTs are incinerators in disguise.

CTs are different from incinerators because they do not burn waste.

CTs will continue to pollute the air.

CTs generate minimal air pollutants.

CTs discourage source reduction, resulting in extraction of fossil fuels and continued transport of plastic waste.

CTs are needed to manage plastics that cannot be prevented or recycled. CTs also create renewable fuel and other products which reduce transportation emissions and fossil fuel demand.

Misconceptions about CTs continue to be obstacles for CT companies:

One misconception is that CTs are just incinerators in disguise.

- Actually, CTs do not burn the waste; as we mentioned, they use high heat, pressure, microorganisms in an oxygen-free environment to produce biogas or syngas.

Another misconception is that CTs will create air pollution. In reality, CTs generate minimal air pollutants when compared to Landfills, and other energy producing plants that extract raw materials and release pollutants and GH gases.

Some people believe that if CT facilities are built, plastic waste will continue to be generated instead of source reduced and this plastic waste will be transported to CT facilities. However, CT facilities do not and should not discourage source reduction.

Preventing waste is a priority. For waste that cannot be avoided and cannot

be recycled through traditional processes, CTs can be used to be divert it from landfills. In addition, CTs create renewable fuel and other products which can be used to reduce transportation emissions and fossil fuel demand.

SB 54 and AB 1857



SB 54 requires plastic packaging to be recyclable but excludes CTs from acceptable recycling practices.

AB 1857

- repeals 10% diversion credit for transformation and CTs.
- prohibits proposed Zero Waste Equity Grant funding to be used for CTs.

What are the Impacts of SB 54 and AB 1857 on the future of CTs.

SB 54, known as the “Plastic Pollution Prevention and Packaging Producer Responsibility Act.” defines “recycling.” SB 54’s definition of recycling excludes processes that generate energy or create fuel from plastic waste. Essentially, this means that plastic packaging processed using (current understanding of) CTs would not qualify as recycling under SB 54.

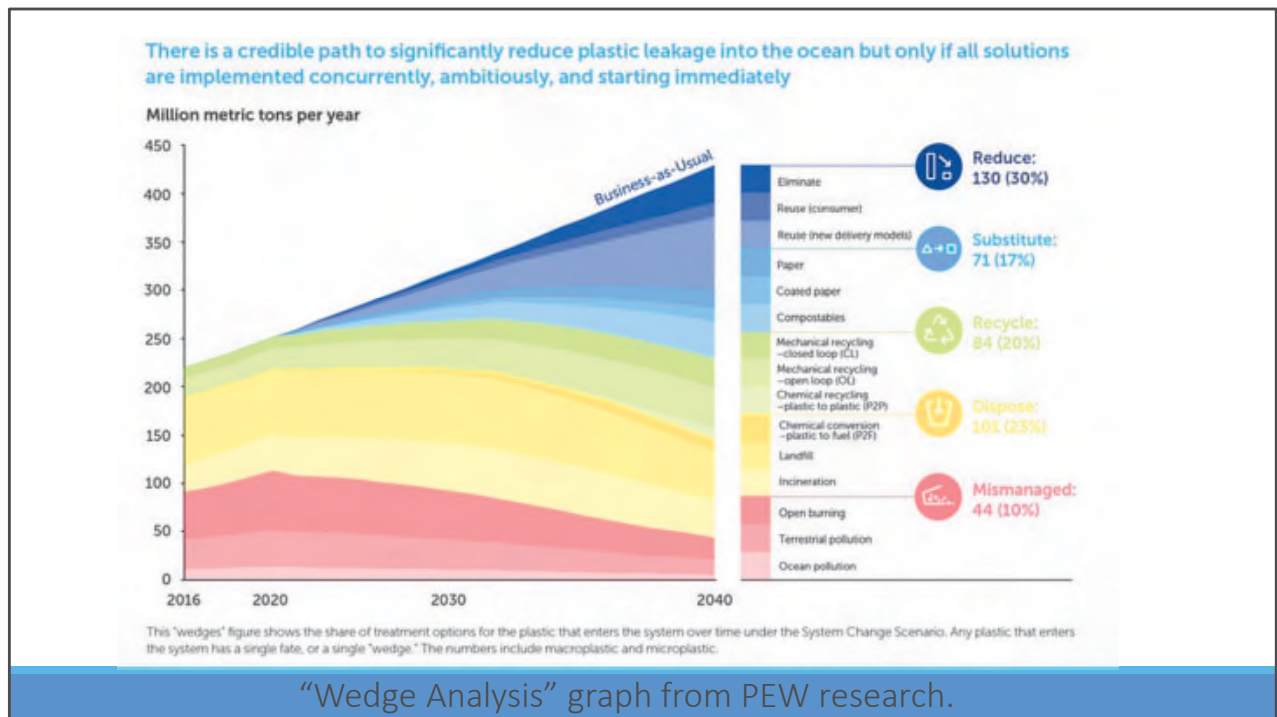
This could discourage siting CTs processing plastic packaging in California and make it more difficult to properly manage various solid waste streams, including certain plastics.

AB 1857 would repeal the State provision allowing jurisdictions to receive diversion credit for up to 10 percent of their solid waste diverted from landfills through processing at transformation facilities or CT facilities.

In addition, AB 1857 states that the proposed Zero Waste Equity Grant cannot be provided for solid waste management projects that result in

“combustion, incineration, energy generation, and fuel production, or any other form of disposal.”

Although CTs do not combust waste, this language will discourage CT facilities in California by removing the incentives for developers to build new facilities that create energy or fuel from waste and for local jurisdictions to use these facilities to properly manage waste streams and reduce dependency on landfills



“Wedge Analysis” graph from PEW research.

Here is the waste management hierarchy over time...referred to as the “wedge analysis”

The graphic depicts that the foremost priority should be to avoid the “mismanagement” of waste which includes litter, missed trash pickup, illegal dumping, open air incineration, ocean waste plumes, shipping waste to other countries that do not have the same environmental standards as the US, applying biosolid with toxins such as PFAS on land, unnecessary mining and extraction of raw resources for chemicals, energy, and fuel, and a host of other activities that can harm the ecosystem, wildlife, and human wellbeing.

The prevalence of all forms of litter and hazardous waste pollution in our environment and its lasting negative impacts on our ecosystems and public health is alarming.

After materials have been prevented from entering the waste stream, many end of use materials have little commodity value and cannot be traditionally be recycled or reused. Consumers throw away mixed items and materials

together in trash bags, sometimes along with hazardous, electronics, and/or contaminated and unsanitary materials. Solid waste management workers sort through this trash to recover items.

According to the 2018 Disposal-Facility-Based Characterization of Solid Waste in California, major materials classes from self haul, commercial, and residential loads were:

paper, glass, metal, plastic, electronics, organics, inert materials, HHW, special waste (waste that cannot grouped with other types of waste), and miscellaneous (mostly organic or synthetic textiles). If we take organics and plastics out, roughly 50% of the waste stream is still left to be managed. If we further remove paper, metal, and glass, we still have over 30% of the waste stream that needs to be managed.

Before China imposed strict contamination limits on imported recyclable material, the US exported materials such as plastics and cardboard which were likely disposed or incinerated in foreign countries.

Currently, the most appropriate management strategy is to rely on landfills. Residents that live near landfills constantly complain about odor, truck trips, dust, noise, methane pollution, and other nuisances from landfill operations. After a landfill is closed, they must still be managed and monitored for methane. The County and neighboring Counties need to reduce landfill disposal to reserve limited capacity for disaster and future generations.

Many opponents may not see the need to tackle residuals or contaminated waste because they do not see 1st hand the energy and resource needed at material recovery facilities or landfills. They may not deal with the odor, pollution, and other hazards workers and residents experience employed at or living near landfills. Full life cycle analysis of options and long-term costs of operating existing facilities including landfill and electrification facilities (fossil fuels are needed) are not considered in the carbon footprint.

AD and Biomass Conversion for Organic Waste

Examples



Anaerobic Digestion
Composting



Biomass Conversion

The next few slides are about suggested messaging. Messaging about what CT types/pathways can be used for as well as what they should not be used for.

Biomass conversion, anaerobic digestion, and composting facilities will continue to receive diversion credit.

Therefore, the development of these facilities should be prioritized over other thermal CT pathways.

As a result, there will be outlets for biomass and food waste and these materials should not directly be sent to other thermal CT pathways.

CTs are not for the Following

Ordinance or Legislation to Prohibit/Reduce sale of Product: Examples

Single-use



Reusable

Difficult to recycle



Compostable
or
Recyclable

Hazardous



Alternative
commodity

There are many waste streams that are difficult to manage through existing processes.

These materials include thin-film plastics (such as single-use grocery bags), or polystyrene food service ware.

There are also materials that contain hazardous elements, such as compact fluorescent light bulbs, which contain mercury.

If there is a viable alternative, these materials should not be sent to CTs. They should be prohibited from sale or distribution.

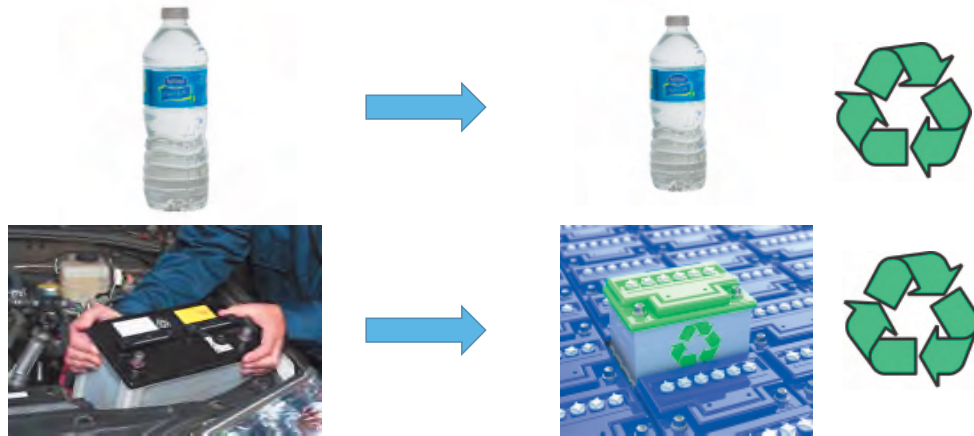
New ordinances, legislation, or other policies prohibiting these materials or requiring the use of alternative materials would be preferable over the use of CTs to manage these materials.

For example, many jurisdictions including Los Angeles County have adopted policies banning the use of single-use plastic bags and polystyrene food

service ware and requiring alternatives to be used instead, such as reusable bags or compostable or recyclable food service ware.

Legislation was passed to phase out CFLs from sale in the state by 2027. Consumers can purchase a safer alternative, LED light bulbs.

Extended Producer Responsibility Circular Economy -Examples

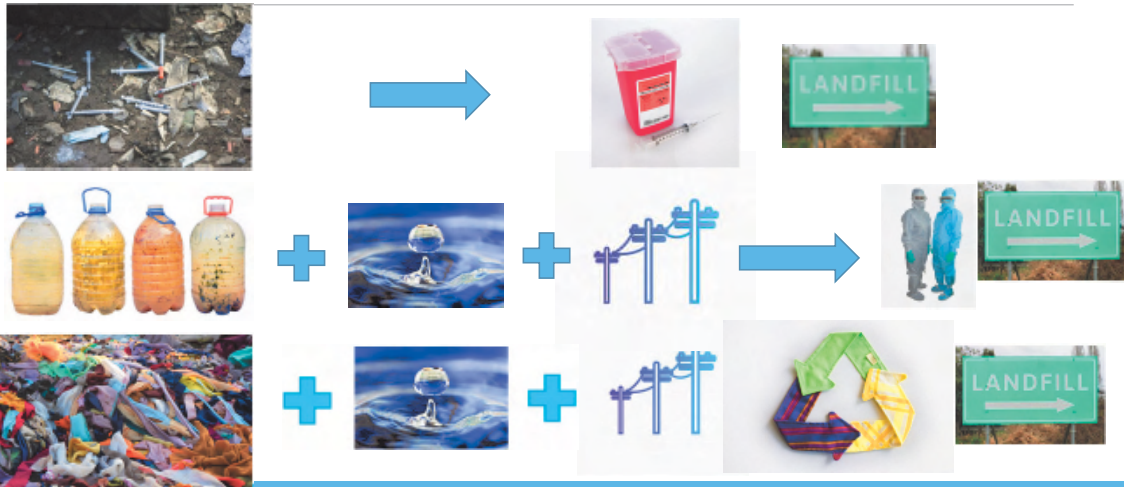


There are also many materials that can be addressed through extended producer responsibility (EPR) policies.

For example, adopting EPR policies requiring manufacturers of plastics water bottles or lithium batteries will reduce the amount of waste generated, reducing the demand for CTs to handle these materials.

No Circular Economy - CTs???

Examples



After organic waste processing facilities are developed and new policies are implemented to eliminate or reduce problematic materials, there will still be certain waste streams that need to be managed.

These include materials that cannot be managed through existing facilities and technologies and cannot be prevented through new policies and programs. It is energy intensive to remanufacture them into usable materials and require other resources such as water.

Ultimately the product will degrade each time it is recycled and or will become contaminated.

With the use of CTs, solid waste becomes a resource rather than a liability in the management of solid waste.

Without CTs, these materials will continue to be landfilled indefinitely. By processing waste that would otherwise be disposed in landfills, CTs will reduce our reliance on landfills and help achieve landfill diversion targets.

CTs can process post-recycled, residual solid waste streams that would otherwise be disposed in landfills and use these waste streams to create low- or negative-carbon fuels including renewable natural gas or “green” hydrogen.

The City of Lancaster announced its goal to become the first Hydrogen City in the United States and may be developing thermal CT facilities to create hydrogen.

We should support and encourage these facilities, because they may shift the perception of CTs and help the public see the benefits of processing waste through CTs to create renewable energy and fuels.

Discussion



Additional efforts are needed to help address concerns and misconceptions that the public and policy makers have about CTs.

- Advocates and proponents of CTs must agree on what needs to be done to manage waste properly to reduce SLCP, litter, contamination of waste streams, and air pollution.
- We need to agree on what feedstocks can be handled by CTs, how would emissions be reduced, etc.

Using hydrocarbons from waste for fuel or energy is not feeding the beast if the feedstock meets certain criteria and that it is much better for the environment than extracting fossil fuels from the earth.

SB 1383 includes a provision for alternative to landfill technologies to become verified as a reduction in landfill disposal if they can demonstrate that their emissions are less than composting.

At the most recent CalRecycle monthly meeting on January 17th, 2023, CalRecycle considered an application by H-Cycle for consideration as an approved SB 1383 organic waste disposal reduction technology. Their non-combustion thermal conversion technology converts organic waste into hydrogen, which can be used for refining operations and heavy-duty fuel cell vehicles. The lifecycle greenhouse gas emission reductions of the technology were evaluated, and the evaluation found that the technology meets the regulatory benchmark to be considered a reduction in landfill disposal. Action by CalRecycle is needed by January 31, 2023 to either approve or disapprove of the determination that the H-Cycle technology constitutes a reduction in landfill disposal. There were 35 public comments with about half supporting approval and half opposing approval

When it comes to CTs, perhaps jurisdictions should not rely solely on AB 939 diversion credit...but rather seek other economic benefits

- Revenue from the sale of energy produced, avoided costs at landfills for the entire life of the landfill, siting new landfills.
- Up front landfills are cheap ...and abundant in the US. But the true cost of managing landfills is expensive.
- Does the cost of lining landfills, collecting leachate, capturing methane gas for many years more than a CT facility?
- Proponents of CTs need to explore ideas about how economics also play a role in suppressing CTs in the US. In many other parts of the world, such as Japan and Europe, CTs are much more prevalent. Because these countries lack space to build new landfills, they have adopted laws requiring that solid waste be diverted to CT facilities as well as requirements for renewable energy production.

So, the question for discussion: “is SB 54’s definition of recycling and AB 1857’s repeal of diversion credit and requirements for grant funding aligned with the State’s goals of:

- Achieving a circular economy
- Reducing air pollution
- Addressing plastic litter and contamination concerns
- Promoting clean energy infrastructure
- Decreasing greenhouse gas emissions, and
- Reducing dependency on fossil fuels for energy and transportation.
- As I stated, I hope this presentation will spark some discussion on how we can encourage CTs.